

PR 9.9 WARPAGE AND TILT OF FLANGE CORRECTION

1.0. SCOPE

This procedure is to be used to correct unacceptable amounts of warpage, (deviation from flatness) or flange tilt, (deviation of flanges from a line normal to the centerline of the web) in fabricated girders or rolled beams.

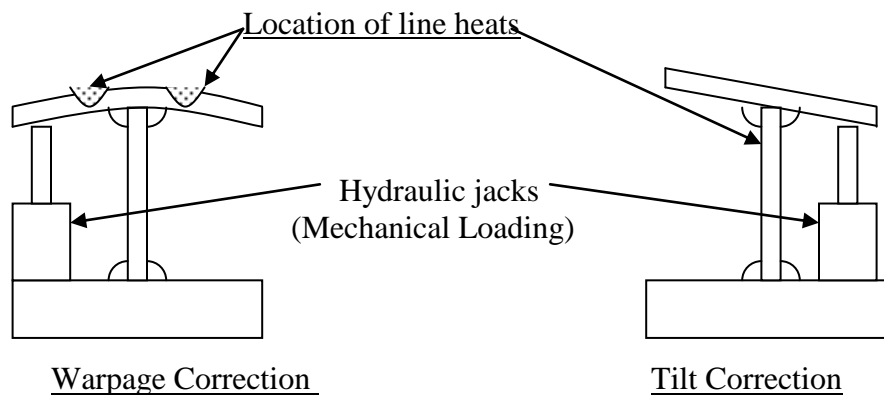
2.0. GENERAL

2.1. Correction shall be achieved through the use of line heating on the girder web, or flanges, or both, in combination with the use of moderate mechanical loading. Correction is to be done in such a manner as to not affect the structural integrity of the fabricated girder or rolled beam.

2.2. All personnel involved with the corrective action should be familiar with this procedure.

3.0. PROCEDURE

3.1. The area to be heated shall be determined by the correction required, see sketch below. Warpage shall be corrected through the use of line heats on the flanges. Flange tilt shall be corrected through the use of line heats on the appropriate surface of the web.



3.2. Heating shall be performed using appropriate sized rosebud style heating torches. Heating shall be confined to areas described in step 3.1 and shall be performed so as to bring the steel in those areas to a temperature between 900°F and 1,000°F as rapidly as possible without overheating the steel. The torch will be kept moving steadily at a minimum 4 IPM rate.

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3.3. Heating patterns shall be marked on the steel prior to heating. Line heats shall be marked so as to avoid the areas of high restraint directly opposite fillet welds. The line heat length shall be determined by the amount of flange tilt or flange warpage requiring correction.

3.4. Heating shall begin at one end of the line and not proceed to the other end until the initial area is brought up to a temperature between 900°F and 1,000°F. The torch operator shall have 900°F, 1,000°F, & 1,050°F temperature indicating crayons. The steel surface temperature shall be monitored frequently during the heating process, and the temperature shall be controlled so as to achieve 1,000°F and not to exceed 1,100°F.

NOTE: No heat will ever be applied directly to the weld.

3.5. Moderate mechanical loading may be used to aid in the correction prior to heating. The force applied shall be a minimum to maintain and support position during the heating process. Mechanical loading shall be achieved using hydraulic jacks in the locations shown for the two types of correction being performed.

NOTE: No additional load will be applied after heating.

3.6. Additional passes may be used if necessary and shall be spaced at approximately 1/4 inch increments.

3.7. After material has cooled to ambient temperature, a Visual Inspection of all heated areas shall be performed for signs of damage and excessive kinks. Also MT Inspection in accordance with governing specifications will be performed.